

# HALLIBURTON

iCem<sup>®</sup> Service

**GREAT WESTERN OPERATING CO LLC-EBUS**

**RAINDANCE FC 23-312HN**

API 05-123-51586

Production Casing

Job Date: Wednesday, August 18,  
2021

Sincerely,

**KYLE BATH**

## Legal Notice

---

### Disclaimer:

All information in this report is provided subject to the terms and conditions which govern the services provided by Halliburton. Halliburton personnel use their best efforts in gathering information and their best judgment in interpreting it, but any interpretation, research, analysis or recommendation furnished by Halliburton are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and empirical relationships and assumptions are not infallible, and with respect to which professionals in the industry may differ. iCem 3D Displacement results are used to understand how fluids intermix during a cement job. Simulation and 3D displacement results are not intended as and should not be used as a replacement for bond logs in determining top of cement. Current 3D model calculations are known to model more volume than the input volume for standard cases due to known calculation improvements required. For rotational cases, the modeled volume will be impacted by the same calculations impacting the standard cases, as well as additional constraints imposed to make the calculation time required operationally feasible. Therefore, until further notice, 3D displacement results should not be used for replacement of a bond log, or used as an identifier of top of cement. HALLIBURTON IS UNABLE TO GUARANTEE THE ACCURACY OF ANY CHART INTERPRETATION, RESEARCH ANALYSIS, OR JOB RECOMMENDATION and any interpretation or recommendation is not for use of or reliance upon by any third party. The customer has full responsibility for any of its decisions which are based on the information provided in this report.

## Table of Contents

---

1.0	Cementing Job Summary .....	4
1.1	Executive Summary .....	4
2.0	Real-Time Job Summary .....	7
2.1	Job Event Log .....	7
3.0	Attachments.....	9
3.1	Job Chart .....	9

## 1.0 Cementing Job Summary

---

### 1.1 Executive Summary

---

Halliburton appreciates the opportunity to perform the cementing services on the Raindance FC 23-312HN production casing. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

Approximately 39 bbl. of spacer were returned to surface.

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Respectfully,

**Halliburton Fort Lupton**

*The Road to Excellence Starts with Safety*

<b>Sold To #:</b> 346459		<b>Ship To #:</b> 9083798		<b>Quote #:</b> 0022862481		<b>Sales Order #:</b> 0907316596				
<b>Customer:</b> GREAT WESTERN OPERATING CO LLC-EBUS					<b>Customer Rep:</b> Great Western Rep					
<b>Well Name:</b> RAINDANCE FC 23-312HN,WELD				<b>Well #:</b> 9083798		<b>API/UWI #:</b> 05-123-51586				
<b>Field:</b>		<b>City (SAP):</b> WINDSOR		<b>County/Parish:</b> WELD			<b>State:</b> COLORADO			
<b>Legal Description:</b>										
<b>Contractor:</b> PRECISION DRLG					<b>Rig/Platform Name/Num:</b> PRECISION 462					
<b>Job BOM:</b> 7523										
<b>Well Type:</b> OIL										
<b>Sales Person:</b> HALAMERICA\HB41307					<b>Srvc Supervisor:</b> Kyle Bath					
<b>Job</b>										
<b>Job depth MD</b> 17205 ft <b>Job Depth TVD</b> 6760 ft										
<b>Well Data</b>										
Description	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Casing		9.625	8.835	40			0	2066		
Casing		5.5	4.778	20		HCP110	0	17205		6759
Open Hole Section			8.5				2066	17425		6753
<b>Tools and Accessories</b>										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Float Shoe	5.5	1	Citadel	17205		Top Plug	5.5	1	Citadel	
Float Collar	5.5	1	Citadel	17200		Bottom Plug	5.5	1	Citadel	

133 Centralizers: 2005.22, 2050.46, 2095.71, 2140.9, 2186.15, 2231.42, 2276.66, 2321.65, 2366.91, 2412.17, 2457.43, 2502.69, 2547.94, 2593.21, 2638.1, 2683.33, 2728.56, 2773.77, 2818.97, 2864.21, 2909.46, 2954.69, 2999.9, 3045.15, 3090.4, 3135.63, 3180.83, 3225.72, 3270.95, 3315.82, 3361.08, 3406.36, 3450.53, 3495.43, 3540.63, 3585.86, 3631.13, 3676.37, 3721.6, 3766.85, 3812.1, 3857.33, 3898.9, 3943.78, 3989, 4034.24, 4079.5, 4124.75, 4169.99, 4215.24, 4260.49, 4305.71, 4350.95, 4395.96, 4441.19, 4486.03, 4531.26, 4576.15, 4621.05, 4666.31, 4710.13, 4755.39, 4800.62, 4845.82, 4891.04, 4936.28, 4981.54, 5026.79, 5071.69, 5116.96, 5162.21, 5207.21, 5252.43, 5297.69, 5342.94, 5387.92, 5433.19, 5478.44, 5523.72, 5569, 5614.28, 5659.29, 5704.56, 5749.82, 5795.09, 5840.36, 5885.63, 5930.9, 5976.17, 6021.44, 6066.71, 6111.99, 6155.27, 6200.55, 6245.83, 6291.1, 6336.36, 6381.61, 6426.87, 6472.15, 6517.39, 6562.65, 6607.89, 6664.42, 6709.67, 6754.94, 6800.2, 6845.45, 6890.71, 6935.98, 6981.24, 7026.48, 7071.72, 7113.28, 7158.54, 7203.81, 7248.67, 7293.89, 7339.1, 7384.32, 7440.8, 7486.02, 7531.27, 7576.52, 7621.76, 7666.96, 7712.21, 7757.46, 7802.33, 7847.28, 7892.54, 7937.77, 8013.24

Fluid Data										
<b>Stage #: 1</b>										
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
1	Diesel	Diesel	40	bbl	7.4				0	
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
2	Spacer	GWOG Spacer	110	bbl	12.0					
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
3	Spacer	Fresh Water	40	bbl	8.33				1680	
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
4	ElastiCem	ElastiCem™ Cement	1850	sack	13.5	1.92	8.91	10	16484	
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
5	Displacement	MMCR Water	20	bbl	8.33				840	
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
6	Displacement	Treated KCl Displacement	341.5	bbl	8.6				14128	
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
7	Displacement	Fresh Water	20	bbl	8.33				840	
<b>Cement Left In Pipe</b>										
<b>Amount</b>		5 ft			<b>Reason</b>			Shoe Joint		
<b>Mix Water:</b>		pH 7		<b>Mix Water Chloride:</b>		0 ppm		<b>Mix Water Temperature:</b>		75°F
<b>Plug Bumped?</b>		Yes		<b>Plug Displaced by:</b>		8.6 lb/gal Treated Water		<b>Disp. Temperature:</b>		75 °F
<b>Cement Returns:</b>		0 bbl		<b>Bump Pressure:</b>		2806 psi		<b>Floats Held?</b>		Yes
<b>Comment:</b> BUMPED PLUG AT 2820 PSI TOOK TO 3400 PSI. RECEIVED 57 BBLs INTERFACE AND 39 BBLs SPACER TO SURFACE.										

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

Seq. No.	Activity	Date	Time	Dwnhole Density (ppg)	Pump A Pressure (psi)	DS Pump Press (psi)	DH Density 2 (ppg)	Stg Total (bbl)	Comments
1	Call Out	8/17/2021	23:30:00						CREW CALLED OUT, REQUESTED ON LOCATION 06:30
2	Depart Yard Safety Meeting	8/18/2021	01:45:00						PRE CONVOY SAFETY MEETING WITH ALL HES EE
3	Crew Leave Yard	8/18/2021	02:00:00						CREW DEPART YARD FOR LOCATION
4	Arrive At Loc	8/18/2021	03:30:00						ARRIVE ON LOCATION, RECIEVED NUMBERS FROM CO REP, TD 17425, TP 17205, SJ 5, CSG 5.5 20#, PREV CSG 9 5/8 40# @ 2066, HOLE 8.5, MUD 10.8, TVD 6760, 134 CENTALIZERS, WATER TEST, TEMP 75, CHLORIDES 0, PH 7
5	Assessment Of Location Safety Meeting	8/18/2021	03:45:00						SAFETY MEETING WITH ALL HES EE TO ASSESS ALL HAZARDS
6	Safety Meeting - Pre Rig-Up	8/18/2021	04:00:00						PRE RIG UP SAFETY MEETING WITH ALL HES EE
7	Safety Meeting - Pre Job	8/18/2021	09:30:00	0.00	16.12	5.00	0.00		PRE JOB SAFETY MEETING WITH RIG CREW AND CO REP
8	Start Job	8/18/2021	10:36:13	8.05	26.59				START RECORDING DATA
9	Drop Bottom Plug	8/18/2021	10:36:39	7.95	31.44	14.00	0.05		LAUNCH BOTTOM PLUG
10	Test Lines	8/18/2021	10:41:33	7.99	302.53	254.00	7.95		TEST LINES TO 4700 PSI

11	Pump Cement	8/18/2021	10:51:58	12.81	628.63	477.00	7.96	9.96	MIX AND PUMP 1850 SKS 632 BBLS CEMENT 13.5 PPG, 1.92 FT3/SK, 8.91 GAL/SK, 10 BPM 1300 PSI, CALCULATED TOC 1744
12	Check Weight	8/18/2021	11:02:28	13.45	1404.25	1323.00	13.13	98.12	VERIFY WEIGHT ON PRESSURIZED MUD SCALES
13	Check Weight	8/18/2021	11:02:51	13.40	1467.62	1354.00	13.12	101.93	VERIFY WEIGHT ON PRESSURIZED MUD SCALES
14	Check Weight	8/18/2021	11:03:56	13.25	1329.52	1289.00	13.48	113.21	VERIFY WEIGHT ON PRESSURIZED MUD SCALES
15	Shutdown	8/18/2021	11:44:30	13.46	661.17	849.00	13.45	517.03	SHUTDOWN AND WASH PUMPS AND LINES ON PUMP 1
16	Shutdown	8/18/2021	12:07:22	8.45	32.99	92.00	13.29		SHUTDOWN, WASH UP PUMP 2
17	Drop Top Plug	8/18/2021	12:12:11	8.45	43.30	22.00	13.31		LAUNCH TOP PLUG
18	Pump Displacement	8/18/2021	12:12:15	8.45	44.27	21.00	13.31		PUMP 381.5 BBLS KCL DISPLACEMENT, FIRST 20 BBLS W/MMCR, 9 BPM 3400 PSI, RECEIVED 57 BBLS INTERFACE AND 39 BBLS SPACER TO SURFACE
19	Bump Plug	8/18/2021	13:00:11	8.68	3338.72	7.00	8.24		BUMPED PLUG AT 2820 PSI TOOK TO 3400 PSI
20	Check Floats	8/18/2021	13:01:00	8.67	3094.48	7.00	8.24		FLOATS HELD TOO 3.1 BBLS BACK
21	End Job	8/18/2021	13:05:53	8.45	34.65				STOP RECORDING DATA
22	Safety Meeting - Pre Rig-Down	8/18/2021	22:00:00						PRE RIG DOWN SAFETY MEETING WITH ALL HES EE
23	Depart Location Safety Meeting	8/18/2021	22:30:00						PRE DEPARTURE SAFETY MEETING WITH ALL HES EE
24	Crew Leave Location	8/18/2021	23:00:00						THANK YOU FOR USING HALLIBURTON, KYLE BATH AND CREW

3.0 Attachments

3.1 Job Chart

